

THE NARCOTIC AS A FACTOR IN POSTOPERATIVE NAUSEA AND VOMITING *

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It has long been recognized that morphine in therapeutic doses may produce nausea and vomiting. Goodman and Gilman (1) attributed this side effect to a medullary stimulation which precedes depression. Bastedo (2) suggested that it possibly is due to the formation of some substance with an apomorphine effect on the vomiting center.

The frequency of the occurrence of this side effect and its importance as a factor in postoperative nausea and vomiting are probably not generally appreciated. If a therapeutic dose of morphine happens to produce nausea and vomiting and the drug is administered postoperatively at fairly regular intervals, it is obvious that an unusual amount of nausea and vomiting will result.

Davis and Whiston (3) recently suggested that morphine be administered the evening before operation as a test dose and that some other drug be substituted in case of idiosyncrasy. Morphine sulfate, $\frac{1}{4}$ grain (16 mg.), was administered orally to 200 consecutive surgical patients the evening before operation and untoward symptoms were noted in 25, or 12.5 per cent.

SeEVERS and Pfeiffer (4), during the course of experiments on 8 normal subjects, administered morphine sulfate, $\frac{1}{8}$ grain (10 mg.), dilaudid hydrochloride, $\frac{1}{4}$ grain (1 mg.), and codeine sulfate, 1 grain (64 mg.), subcutaneously and intravenously sixteen times each during 48 experiments. The incidence of nausea was as follows: morphine, 57 per cent; dilaudid, 37 per cent; codeine, 0 per cent. These authors stated: "Conditions were hardly ideal for the study of nausea in this series, because of the fact that a light meal had been ingested one and one-half to two hours before the experiment."

It is obviously impossible in the case of emergency operations to determine the effect of morphine before the operation, but in elective procedures such a determination presents few difficulties.

Over a three year period, 103 consecutive patients with pulmonary tuberculosis, who were to have major operations for collapse of the lung, were given test doses of morphine sulfate, $\frac{1}{8}$ grain (10 mg.), subcutaneously a day or more before operation. The drug was administered one-half hour to one hour after a full meal, while the patients were

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at rest in bed. This seemed to us to be the optimal time for testing, since we were primarily interested in the effect of the drug on the patient's ability to retain nourishment. Pantopon, $\frac{1}{2}$ grain (20 mg.), was used in place of morphine in 9 cases early in the series. The use of pantopon was abandoned after it was realized that there is little, if any, difference between the action of the two drugs (5). Forty-four (43 per cent) of these patients receiving test doses of morphine (or pantopon) exhibited nausea or nausea and vomiting.

Thirty-two of the 44 patients, who had become nauseated after the administration of morphine, were given test doses of dilaudid hydrochloride, $\frac{1}{32}$ grain (2 mg.), subcutaneously the following day. Dilaudid produced the same degree of nausea in 24; 8 experienced no nausea.

The 24 patients who were nauseated by morphine and dilaudid were then given test doses of codeine sulfate, 1 grain (64 mg.), subcutaneously; in 2 nausea developed.

Twelve of the 44 patients, who had exhibited nausea after morphine, were given codeine without an intervening test dose of dilaudid (because of lack of time); none of these was nauseated by the codeine.

Morphine produced urticaria (without nausea) in 2 additional patients. Dilaudid, but not codeine, produced the same reaction in one.

Thus, in 101 patients, the drug used for preoperative and postoperative medication was as follows: morphine, 57; dilaudid, 9; codeine, 35. The remaining 2 patients who were nauseated by codeine were given barbiturates preoperatively and a barbiturate with small doses of codeine, when absolutely necessary, postoperatively.

A total of 276 major operations was performed on these 103 patients. In 206, stages of extrapleural thoracoplasty were carried out; 68 were extrapleural pneumonolyses (followed by extrapleural pneumothorax or paraffin fillings); and 2 were miscellaneous procedures. Most of the thoracoplasty stages were performed with ethylene or cyclopropane anesthesia, and most of the extrapleural pneumonolyses with local anesthesia.

Severe postoperative nausea and vomiting, requiring the administration of parenteral fluids for the maintenance of an adequate fluid intake, was rare among these patients. Exclusive of the day of operation, no postoperative nausea was experienced by 52 patients having a total of 98 operations. A slight to moderate degree of nausea, with very occasional vomiting, was noted after 87 of 166 operations performed upon 49 other patients. In none of these patients was the nausea severe enough to interfere seriously with an adequate fluid intake (2000-4000 cc.).

Only 2 patients had postoperative nausea and vomiting severe enough to require intravenous administration of fluids in order to maintain an adequate water balance. Only one infusion was necessary in each patient; in one patient glucose was given on the first day following the sixth stage of a seven stage thoracoplasty; in the other patient glu-

cose was given on the first day following the third stage of a five stage thoracoplasty.

Unfortunately, due to the absence of accurate records, we were unable to compare the incidence of postoperative nausea and vomiting in this series of cases with the incidence in patients to whom morphine had been given routinely and empirically before we started testing for reactions. We are certain, however, that the administration of suitable narcotics has reduced our incidence of postoperative nausea and vomiting to a considerable extent.

COMMENT

Morphine in therapeutic doses apparently produces nausea and vomiting in an appreciable number of patients. Other opium derivatives, such as dilaudid and codeine, may be found to be more suitable for individual patients in avoiding this unwanted side effect. The determination of a suitable narcotic prior to an elective operation is a simple matter and may eliminate unnecessary postoperative nausea and vomiting and materially alter what would otherwise have been a stormy and uncomfortable convalescence.

The author acknowledges with gratitude the assistance of Elinor Strong, R.N., in keeping and compiling the records used in this study.

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